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FORCE-VELOCITY-POWER PROFILES IN ELITE YOUNG SOCCER PLAYERS

K., Miny, & B., Jidovtseff

Department of Training and Assessment of Physical Fitness, University of Liège, Belgium



Université de Liège

Introduction

- Strength, power and speed (training) usually support key decision-making situations in soccer (1). In fact, straight forward sprints are the most frequent physical actions in goal situations. The ability to accelerate and decelerate also plays a crucial role in overall soccer performance (2).
- Ballistic and impulsive performance of the lower limbs, such as jumping or changing direction, depends on maximal power, strength capabilities and/or force-velocity profiles (3 & 4).

Objectives

- The main purpose of this research was to assess the isoinertial Force-Velocity-Power (F-V-P) profile in young elite soccer players.
- Furthermore, this research aims to compare force, velocity and power qualities among different age categories (under (U) 17, U19 & U21).
- The ultimate objective is to better understand the relationships between neuromuscular system and functional performance.

Methods

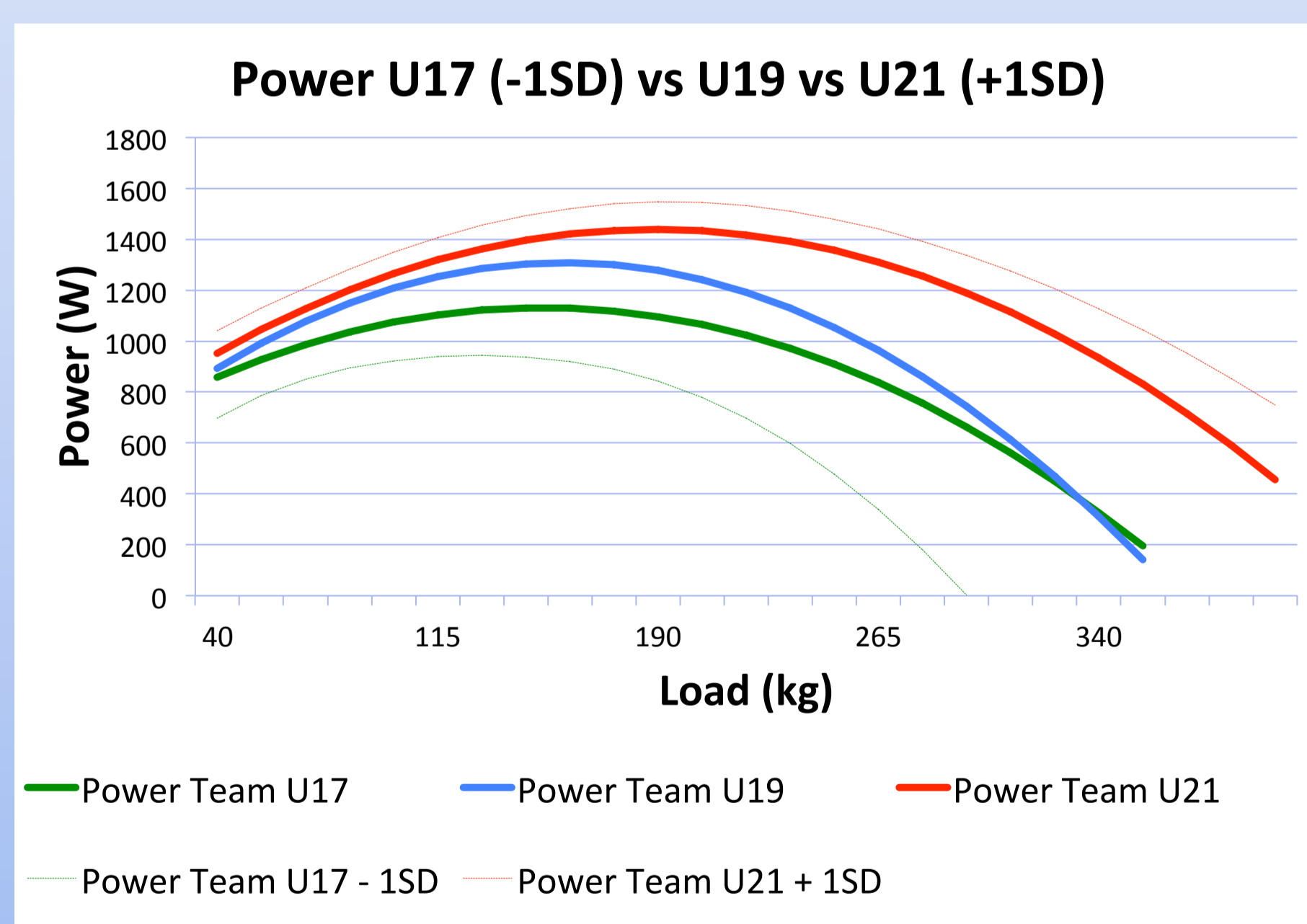
- Forty-four males ($18,3 \pm 1,2$ years; $69,9 \pm 7,5$ kg; 176 ± 5 cm) performed a ballistic supine leg press test at three distinct loads: 70, 160 and 250 kg.
- Peak and mean velocity and power were measured with a linear position transducer attached to the weight stack.



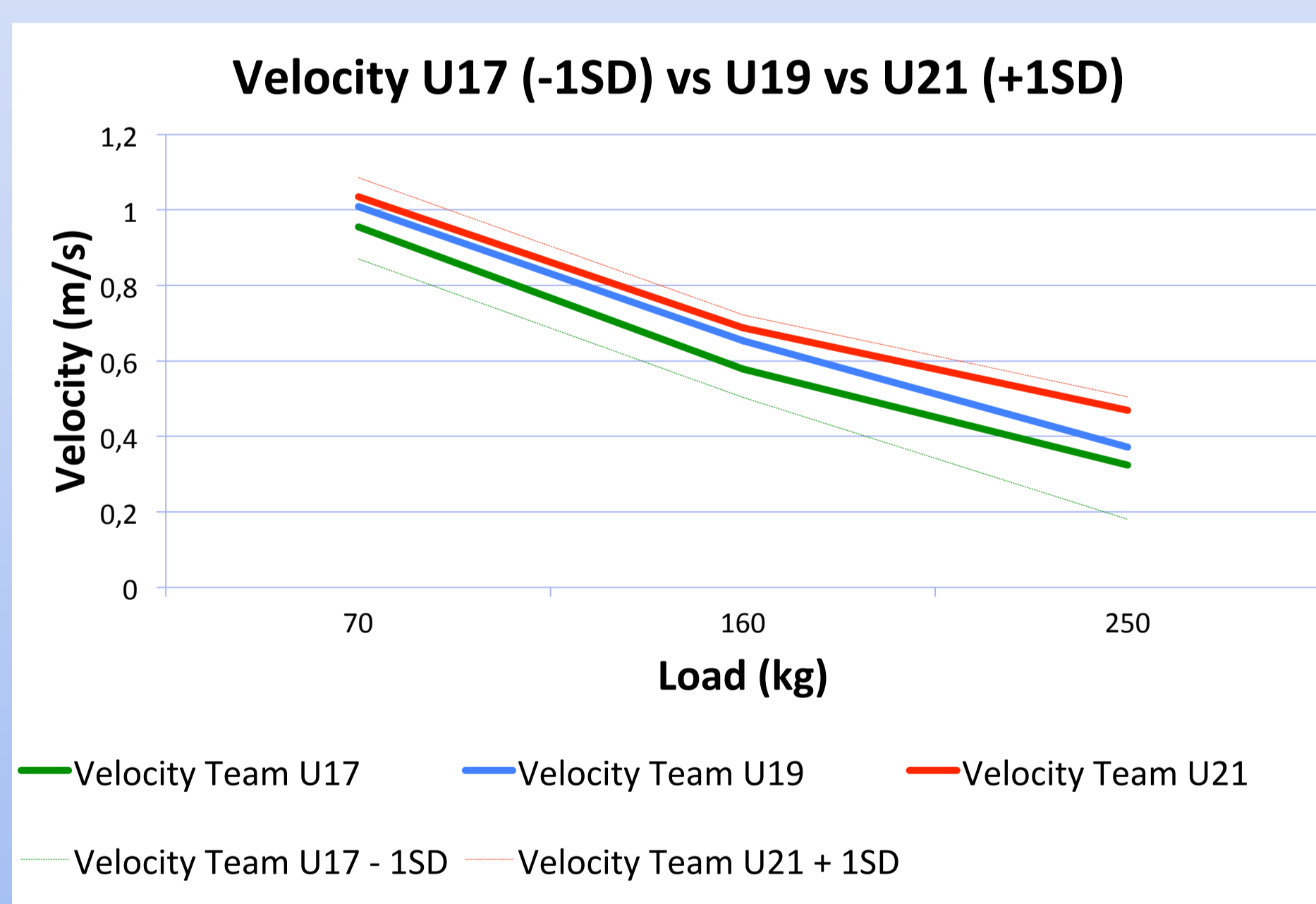
- ➔ Best values at each load were used to determine power-load and velocity-load regression lines for each player and each team.
- ➔ An ANOVA was used to determine statistically significant differences among the different age categories.

Results

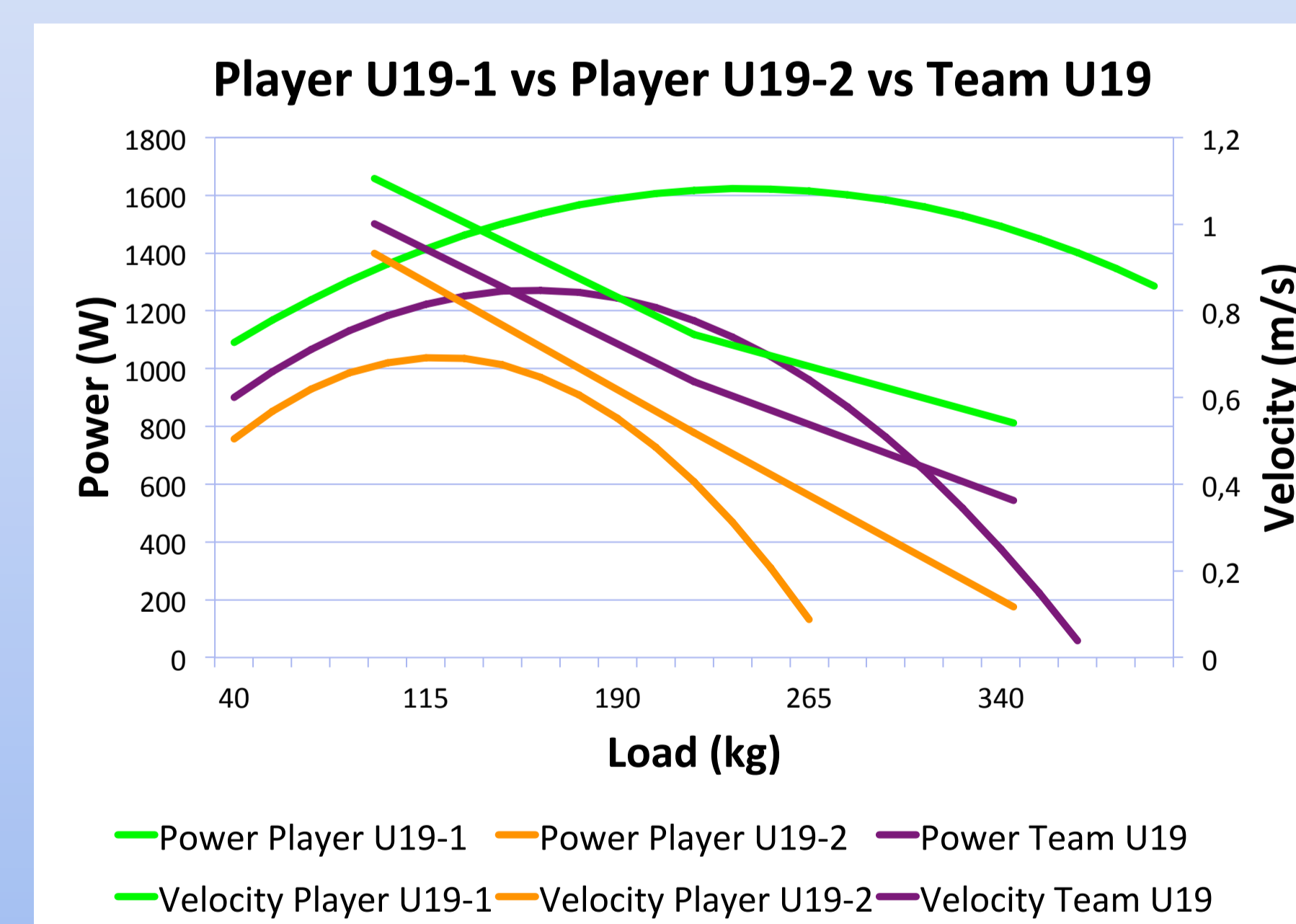
- U21- ($n = 7$) and U19-players ($n = 20$) were significantly better than U17-players ($n = 17$) in terms of power and velocity ($p < 0,05$). However, no significant difference was found between the two oldest categories.
- Graphic 1 and graphic 2 respectively show the power-load and velocity-load profiles (regression lines) for the U17, U19 and U21 teams, but also include the lower and upper standard deviation (SD) for the U17 and U21 teams, respectively. It is important to note that this profile can be very different between players within the same age categories (graphic 3).



Graphic 1: power-load regression lines of the U17, U19 and U21 teams



Graphic 2: velocity-load regression lines of the U17, U19 and U21 teams



Graphic 3: power-load and velocity-load regression lines of two U-19 players in comparison with the U19 team

Conclusions

- F-V-P profiles can be significantly different between two players within the same age categories (especially in younger teams); genetics, playing position, (previous) strength training and other factors (such as puberty) can have a major influence.
- Such profiling enables fitness coaches to individualize strength training, monitor specific training adaptations and potentially aid soccer players to become quicker and more decisive in games.
- Correlations with sprinting and jumping performances will be determined in further research.

References

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